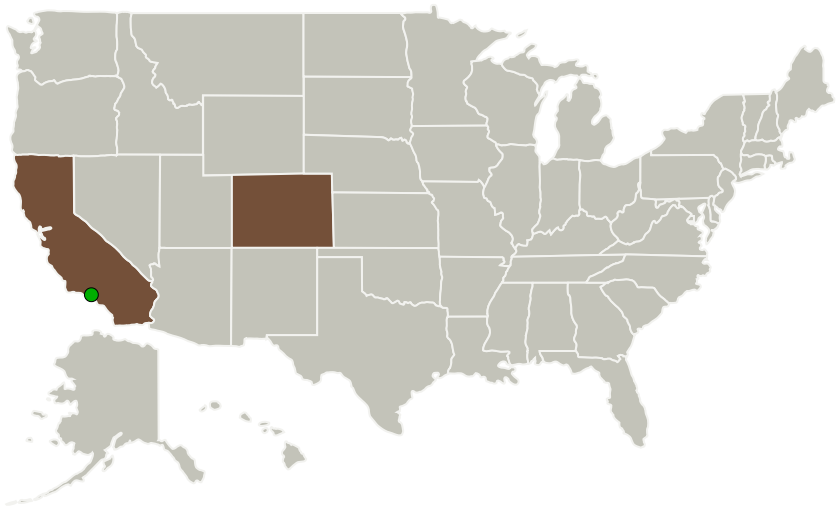
Thermal Insulator for a Venus Lander, Phase I

Completed Technology Project (2017 - 2017)

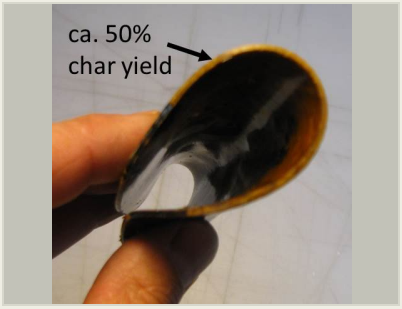
Project Introduction

A lander on the surface of Venus is heated by the 460 ☐C surface temperature, which, even with the best current designs using passive insulation, cause its electronics to fail in much less than a day. Active cooling concepts are not only exceedingly heavy but also exceedingly inefficient. TDA proposes a new insulation for the exterior of the lander that incorporates heat rejection mechanisms that apparently have not been previously considered for the Venus surface. Our insulation will make use of a flexible material that has been recently developed at TDA, and we will compare it to other potential but brittle insulations. Order-of-magnitude calculations suggest that the lifetime of the lander can be extended from hours to days.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
TDA Research, Inc.	Lead Organization	Industry	Wheat Ridge, Colorado
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



Thermal Insulator for a Venus Lander, Phase I Briefing Chart Image

Table of Contents

Thermal Insulator for a Venus Lander, Phase I

Completed Technology Project (2017 - 2017)

Primary U.S. Work Locations	
California	Colorado

Project Transitions

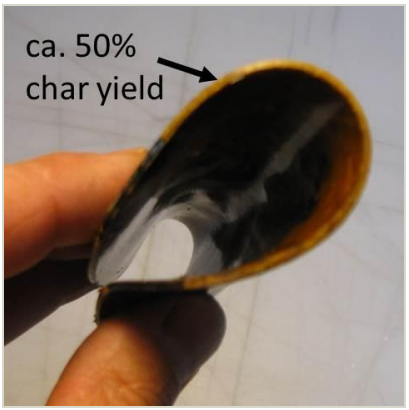
June 2017: Project Start

December 2017: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139497)*

Images



Briefing Chart Image
Thermal Insulator for a Venus Lander, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/132814)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
TDA Research, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

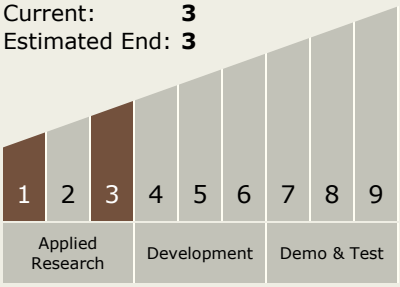
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Michael Diener

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.2 Heat Transport

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System